

## **PATTERNING LAYERS COMPRISED OF SPIN-ON CERAMIC FILMS**

### **ABSTRACT OF THE DISCLOSURE**

[0051] The present invention comprises a method for forming a hardmask including the steps of depositing a polymeric preceramic precursor film atop a substrate; converting the polymeric preceramic precursor film into at least one ceramic layer, where the ceramic layer has a composition of  $\text{Si}_v\text{N}_w\text{C}_x\text{O}_y\text{H}_z$  where  $0.1 \leq v \leq 0.9$ ,  $0 \leq w \leq 0.5$ ,  $0.05 \leq x \leq 0.9$ ,  $0 \leq y \leq 0.5$ ,  $0.05 \leq z \leq 0.8$  for  $v+w+x+y+z=1$ ; forming a patterned photoresist atop the ceramic layer; patterning the ceramic layer to expose regions of the underlying substrate, where a remaining region of the underlying substrate is protected by the patterned ceramic layer; and etching the exposed region of the underlying substrate. Another aspect of the present invention is a buried etch stop layer having a composition of  $\text{Si}_v\text{N}_w\text{C}_x\text{O}_y\text{H}_z$  where  $0.05 < v < 0.8$ ,  $0 < w < 0.9$ ,  $0.05 < x < 0.8$ ,  $0 < y < 0.8$ ,  $0.05 < z < 0.8$  for  $v+w+x+y+z=1$ .